Claims

1. A method of forming a particle mass comprising at least two particle populations arranged in a desired graded relationship, the method comprising:

forming in a container a first layer of dry particles constituting a first particle population having a desired particle size distribution,

superimposing on the first layer a second layer of dry particles constituting a second particle population having a desired particle size distribution,

the second layer being in direct contact with the first layer at a contact interface, and

causing the particle mass in the container to vibrate to cause a desired degree of migration of particles from one or both layers across the contact interface under the influence of force experienced by particles in the mass.

2. A method as claimed in claim 1 wherein the particle mass in the container is caused to vibrate under the influence of gravitational and/or centripetal and/or magnetic and/or electromagnetic force.

3. A method as claimed in claim 1 or claim 2 wherein the particle mass is caused to vibrate by vibrating the container.

4. A method as claimed in any of claims 1 to 3 wherein one or more additional dry particle layers is/are successively stacked on the second or a subsequent layer of the stack,

each additional layer comprising dry particles constituting a particle population having a desired particle size distribution,

each additional layer being in direct contact at a contact interface with the layer on which it is superimposed, and

the particle mass is vibrated after completion of, or at intervals during the assembly of the stack to cause a desired degree of migration of particles across one or more of the contact interfaces under the influence of gravitational, centripetal force or other applied forces.

5. A method as claimed in any of the preceding claims wherein one or more layer of particles also contains whiskers and/or microfibres.

6. A method as claimed in any of the preceding claims wherein at least two particle layers in direct contact at a contact interface comprise particle populations which are selected such that the population of one layer has a desired set physical and/or chemical properties different from that of the population of the other layer.

7. A method as claimed in any of the preceding claims wherein the container containing the particle layers is a mould defining the desired shape of the particle mass.

8. A method as claimed in any of the preceding claims wherein the particle mass in the container is pressure compacted during or after the vibration step.

9. A method as claimed in any of the preceding claims wherein at least one particle layer comprises ceramic particles.

10. A method as claimed in any of claims 1 to 9 wherein at least one particle layer comprises metal particles.

11. A method as claimed in any of claims 1 to 10 wherein at least one particle layer comprises polymer particles.

12. A method as claimed in any of claims 1 to 8 wherein a particle layer comprising ceramic particles is superimposed at a contact interface on a particle layer comprising metal particles, or vice versa.

13. A method as claimed in any of the preceding claims wherein at least one particle layer is prepared by pre-blending the components thereof prior to forming the layer in the container.

14. A method as claimed in any of the preceding claims wherein after the vibration step the particle mass is fused into a coherent article.

15. An article obtained by the method of claim 14.